

KARO ECHO Newsletter

KARO ECHO

Serving the communities
of El Cerrito and
Kensington, California

Web: www.karoecho.net

Facebook:
[KARO ECHO facebook](#)

Email: info@karoecho.net

Important Frequencies

KE Primary: 146.415 MHz
Weekly Net, Thurs. 1900

KE Secondary: 146.475 MHz

4Cs Repeater: 145.110 MHz
(TX down 600 with PL 82.5)

Monthly Meetings

In-person meetings

2nd Monday of each month
7:00 pm

(online via Zoom also)

Kensington Comm. Center,
59 Arlington Blvd,
Kensington, CA

The next meetings are:

Apr. 10th, 2023

May 8th, 2023

Meeting minutes are on
[the website](#) in the past
events page.

What's New

KARO ECHO Monthly Meeting, Apr. 10th, 1900 — In-person or Zoom

The monthly KARO ECHO meeting will be **in-person or virtual (Zoom)**, at 1900, Monday Apr. 10th. The meeting will focus on training and preparation for the Spring KARO ECHO Simulated Emergency Test (SET) exercise to be held Sat. April 22, 1000-1200. [Full agenda link.](#)

KARO ECHO SET April 22, 10am — noon

The KARO ECHO spring Simulated Emergency Test (SET) exercise will be Saturday morning April 22, 10am to noon. [Please fill out the online registration form](#) to participate. It is a great opportunity to practice passing messages and working on a busy net frequency. As in past SETs, we will emphasize passing written form messages on auxiliary frequencies to the net frequency. New this year will be practice handling welfare traffic and a demonstration of relaying those messages, through a designated operator, to internet email (such as to a distant relative) using the Winlink system to bring radio digital traffic to a distant internet connection (assuming the local internet and phone and texting will not be available in a major disaster). More SET background information can be found on Pages 4-6.

Dan Goldstein's March Presentation Slides Available

Thank you to Dan Goldstein KJ6KEU the ARRL East Bay Section Emergency Coordinator, who was the speaker at our March meeting. [Here is a link to his presentation slides.](#) Unfortunately, a recording was not made of the presentation, but a similar recorded talk to ORCA a few months ago is available here: [EmComm Mutual Aid in a Digital World](#)

QSO Today Virtual Ham Expo Recordings Available

The [QSO Today Virtual Ham Expo](#) was March 25-26, 2023, but you can still watch presentations on demand until April 28th (with \$15 registration). A [presentation topic list](#) can be found here. Past recordings from earlier Ham Expos are [available for free here](#). One of the Ham Expo presentations featured the [RATPAC](#), which, in addition to having weekly live online presentations, also offers a [large archive collection of free recordings](#) on ham radio topics.



LOCAL NETS**KARO ECHO Simplex Nets**

146.415 MHz (primary)

146.475 (secondary)

Voice net: Thursday, after the West Contra Costa RACES Net, but not before 1900 hours local time.

Digital net: Monday, 1900

West Contra County ACS/RACES Net

145.110 MHz repeater
(TX down 600 with PL 82.5)
Thursday: 1845 local time

Contra Costa County HF EmComm/RACES Net

3893 KHz. Thursday, 1835

American Red Cross of the Bay Area (ARCBA)

WW6BAY Repeater
443.975 MHz
TX +5 MHz, PL 100 Hz
Wednesday: 2000 local time

BOARD MEMBERS

President: Howdy KE6BEE
Vice-Pres: Frans KJ6IUV
Treasurer: Annette KJ6SWK
Secretary: Tom KN6BUY
Em. Coor: Howdy KE6BEE
Outreach/PR Manager:
Blake KN6CMP
Web-maestro: Rob K6RJM
Board member at large:
Hal KK6NDF
Net Manager and Newsletter
Editor: Howdy KE6BEE

What's New *(continued)***First Wed. Neighborhood nets and Communication Hub Activities**

West county EmComm net out of Richmond at 11 am (starts after the Richmond siren test) FRS/GRMS simplex (on Ch.19, secondary Ch. 17), followed by a ham net on the **WA6KQB 440 repeater** with WA6DUR repeater as secondary (see WA6DUR freq. information below)

East Richmond Heights, ham operators check-in at 1845 on Walt's WA6DUR repeater 442.150 +5 offset and PL tone 107.2Hz.

EC4 (central El Cerrito Hills) CERT Net, Ch. 2 (462.5875), at 1845

EC9 (north El Cerrito Hills) CERT Net, Ch. 15 simplex (462.550), at 1900

East Richmond Heights, Ready-2-React Net, Ch. 7 (462.7125), at 1930

EC7 and EC8 (north El Cerrito) CERT net, Ch.4 (462.6375), at 2000

Ken6 (SW Kensington) CERT net, on first Tuesdays, Ch. 6 (462.6875) at 1900

Richmond simulated EOC net, first Thursdays at 1030, on three simplex frequencies in this order: 147.450, 441.000, 223.400

Albany Radio Net, Wed. (weekly) 1900 on Ch.19 [Albany Radio groups.io](https://albanyradio.org/)

[Coordination of neighborhood FRS/GMRS frequencies can be found here.](#)

New Local Ham Licenses

New El Cerrito licenses issued: none for this month

New Kensington licenses issued: none for this month

New Welcome New KARO ECHO Members

Angela KN6ZDG (Emeryville) - new license, congratulations!

Kevin KB3WIU (El Sobrante)

Action - Contribute to this Newsletter

Content for this newsletter is always welcome. We are seeking submissions for a new free classified section for selling/trading radio equipment/services. Anyone with events or other content suggestions please send them to the newsletter editor Howdy ke6bee@arrl.net

What's New *(continued)*

New HF Material on the Website

Thanks to Don NI6A for posting some new documents on the KARO ECHO website. Topics include: HF antennas, propagation and noise reduction and using Software Defined Radio (SDR) receivers available on the internet (a good way to start playing with HF before you have a radio of your own).

[Short Introduction to HF Antennas and Propagation](#)

[Near Vertical Incidence Skywave \(NVIS\) antennas](#) for short range (short skip)

[Introduction to HF, Short Wave, and SDR Listening](#)

[Reducing RF Noise Interference on HF \(the High Frequency bands\)](#)

2023 KARO ECHO Survey

Please take a few minutes to [provide feedback through this online survey](#). It will help inform our training, meetings, nets, SETs, events, etc. We really hope for a high number of responses, whether you are currently active or not. We'd like to know what you think, and make KARO ECHO an even better group.

Online payments to KARO ECHO

It is now possible to pay KARO ECHO membership online through PayPal. No PayPal account is required. Use the [donate button on the KARO ECHO home](#) page, or under the heading "[Get Involved—Join](#)". Your dues and donations are the source of funds for our ongoing costs of operation, as well as installing equipment we need to have in place for effective emergency operations. Currently, we are planning to install additional antennas and patch boxes in El Cerrito and Kensington to give easy outdoor access to high quality communication for operators deployed various public spaces.

Donate



KARO-ECHO Treasurer's Report				
As of April 5, 2023				
	Credits	Debits	Bank Balance	Notes
Balance Forward from 3/11/2023			\$2,055.08	
Since last report:				
Memberships				
	\$30.00		\$2,085.08	KB3WIU
	\$30.00		\$2,115.08	KN6ZDG
Balance 4/5/23			\$2,115.08	
30 Total paid members to date for 2023				

2023 Spring Simulated Emergency Test (SET) Exercise

The Saturday April 22 SET will be held 10am to noon, with an optional on-air debrief/discussion afterward.

[Please use this linked online form to register for the upcoming KARO ECHO Simulated Emergency Test \(SET\) exercise.](#) The SET will practice radio communications in the context of a hypothetical earthquake disaster.

Operators who are new to our SET are welcome and it isn't too late to get up to speed. We will provide training ahead and pairing with an experienced operator during the SET, if desired, to make it more comfortable to join the SET for the first time.

Please fill out the registration as soon as possible to allow getting the message assignment schedule out several days ahead of the SET. It is fine if you wait to reply with additional details later. You can sign up with the basics now and follow-up with more information later (filling out the form twice or following up by email is fine).

A new element in this SET will be Welfare traffic. [This document by Don NI6A further discusses handling welfare traffic and ARL numbered messages.](#) For this SET we will focus on relaying voice and digital welfare messages through a designated operator (Rob K6RJM with tactical call "Winlink Relay") who will use digital radio link to relay welfare messages to remote, internet connected, Winlink operating stations to be delivered to hypothetical distant friends and relatives as internet email. The assumption is that there is not working local internet, text, phone service, and a digital radio link to a remote location that still has internet is one of the few ways to get this kind of welfare traffic delivered to an internet email. If you have an internet email address that you would like to specify to route the message as a test/demonstration, you can include that address in the To: line of your message. If you don't have an email that you are comfortable reading/sending over the air, you can use this club email address to collect welfare traffic (karoecho.w6eck@gmail.com). We will not emphasize NTS routed welfare traffic or ARL numbered messages for this exercise, but the information on those topics linked above is useful background for future training. Emergency and Priority messages will take precedence during the SET and the net control may ask for welfare traffic to standby, or direct it to be interrupted, if it facilitated more timely handling of emergency or priority traffic.

If you are interested in trying some digital operation during this SET, include your interest on the form and/or reach out for more information. There is still time to get oriented to digital before the SET if you aren't fully confident yet.

Below is further background on the SET. The premise of this exercise is a strong earthquake nearby on the Hayward fault.

Radio net check-ins will begin at 1000 on 146.415 simplex. Initial check-in will be with your FCC call sign (phonetically) and no other information.

Following initial check-ins, there will be a roll-call request for operator location and intensity reports using [the Modified-Mercalli scale](#) (MM) voiced "mike-mike" followed by the number 1-10 based on the

2023 Spring Simulated Emergency Test Exercise (cont.)

descriptions in the link provided. You are free to decide for yourself what you want the level to be locally. It is ok if all the information is not completely consistent with other reports.

Following the location and mike-mike report, net control will confirm a tactical call sign for each operator, based on location, ICP, etc. (the operator can suggest the tactical call sign they want to use, but it must be confirmed by both the operator and net control). Once assigned, you should announce yourself to the net with the tactical call sign, but remember to also use your FCC call if more than 10 minutes have passed, or when terminating communication on a freq. (when moved to another freq. to pass a message for instance). Addressing one another on the net should be done with the tactical call signs, but to follow FCC rules, the FCC call needs to be dropped in passing at the necessary times (but avoid using FCC calls as how you call other operators). This may be hard as many of us have become very familiar with each other's FCC call signs, but it is a good practice to keep track of the tactical call signs and use them for making contacts during the SET. In an actual prolonged disaster, operators (and FCC calls) will come and go, but tactical calls for a particular position can endure and be passed between operators filling that role. Tactical calls also convey more contextual information about the function of the operator.

We will use the [KARO ECHO modified ICS-2311 message form](#), that contains a header with extra information useful to the radio operator. You can print and write on the form by hand, or type directly into it as a fillable form in Adobe Reader. [Here are examples of messages used in past exercises](#). You can re-use or edit previous messages, and/or write your own messages from scratch. Always voice "This is a drill" before and after transmitting your message (or any other traffic that may cause alarm for an incidental listener). This is not part of your written message and does not count in the word count. To balance the activity across all operators, most of the messages are proposed between neighborhood areas rather than everything going to the EOC. It might be harder to think up a message for this case rather than reporting a dire emergency to the EOC, but it is a very useful type of mutual aid assistance to practice, and while not super important to get all the messages to be logical for the locations involved, just try to think about it in the context of helping and coordinating with neighbors in other parts of the city with resources of tools and people, etc.

To keep the net frequency open for traffic, stations requesting to pass traffic will be moved to another frequency to pass the traffic and then return to the net. You should [make sure you can tune your radio to nearby 2m and possibly 440 simplex frequencies](#) (lookup VFO or "frequency" mode in your manual, rather than using memory presets or "channel" mode). Always announce when you return to the 146.415 net by voicing your callsign and "back". If unsuccessful with passing your traffic, tell net control so the message can be routed again differently. If you have questions about using the message form or procedure please feel free to ask me before the exercise. If you are new to the SET you can also ask to be paired with another operator.

It is fine to have concentrations of traffic on the net, and the time schedule intentionally simulates periods of heavy traffic. It is not rude to jump in with a brief ID between transmissions to get the attention of net control, you will be added to the queue of traffic that net control is managing. It is a good exercise for everyone if things are happening rapidly (but still speak slowly and calmly enough to be easily understood). During a pause in transmission announce yourself with your tactical call sign. You will be acknowledged and may be asked to standby if there is something else going on. If you have an emergency (immediate life safety) message, voice "emergency" and your call sign and you will be handled faster. It is always important to

2023 Spring Simulated Emergency Test Exercise (cont.)

remember to keep transmissions as brief as possible and drop PTT to leave open air in between longer transmissions to allow traffic to break in, as necessary.

In addition to the formal written messages, operators are encouraged to make general situational awareness announcements throughout the SET to help others understand where there is more and less damage, and needs, and how conditions evolve over time. General requests for resources (skilled people and/or tools) can also be made or offered as mutual aid between neighborhoods. [Here are a few examples.](#) Feel free to improvise related responses to requests or announcements. Responses don't have to be immediate. In fact, it is more realistic if they are delayed (until others at the location have been engaged in processing the information). Even though these are not formatted messages written on the modified ICS-213 form that we typically use for messages, it is useful to jot the text of what you want to say on paper before you voice it. This will help you voice a clear, concise message and you can provide accurate fills, if anyone needs you to repeat anything.

For this exercise, some operators may have a neighborhood net feeding them information and messages may be passed on to the ham net from that source. You are also welcome to simulate this kind of traffic like this that would occur at an incident command post/hub. Neighborhood net messages should be processed/triaged into an appropriate form for the ham net (and made as concise, as possible), before transmitting on the ham net. In most cases the modified ICS213 form should be used if the message is directed to the EOC or another ICP/hub. If it is a general announcement or resource request, it does not need to be in that form, but it is still advised to work from a screen written message (as an operator, don't just read a written message that has been handed to you without being reviewed by the message center manager, or person with equivalent role for your activity area).

Two stations that come together on a resource request, without a formal written message form, may be asked to move to another simplex frequency to complete the coordination for the exchange. Meet on the other frequency, confirm your contact and pass some hypothetical information about where/how to meet. You do not need to physically meet or exchange a formal written message on the modified ICS-213, however, those who wish to practice operating mobile are encouraged to move around and may actually rendezvous in person, if desired, or otherwise relocate during the SET. Report back to the main net when you return to net frequency or otherwise check in/out as a result of changes in your operation/location.

There will not be many pre-scheduled messages directed to the EOC in order to spread the messages across all operators. The comm. hubs (especially those with neighborhood nets generating traffic) will likely generate additional messages that could be routed to the EOC, as appropriate. Anyone who wants to write a message to the EOC, in addition to their other assigned messages, is welcome to do so, but messages to the EOC shouldn't originate from operators outside of El Cerrito and Kensington.

Once all the operators have [registered for the SET using the online form](#), a schedule and recipient for each operator to send and receive two formal pre-written messages will be distributed to help create a good flow of traffic throughout the net. You can choose the precedence. Do not worry if you get off schedule, just try to pass it when you can. It is possible the other operator might not be available at the time, but that is a realistic possibility in an actual event. Send any questions to Howdy ke6bee@arrl.net

Activities

Weekly Net Control Rotation

Thanks go out to the volunteer stations who have been taking turns as Net Control Stations (NCS) each Thursday. This rotation has been working very well and everyone has been doing a great job. The regular NCS roster has 9 operators. Fill-ins are sometimes needed and we can always add another to permanent rotation. Please volunteer to give it a try. [Download the new Net Script for NCS operators.](#)

Below are the **new scheduled dates** for each operator next year. The [KARO ECHO google calendar](#) also has these assignments and can be found at the bottom of the events page. Add to your electronic calendar By pressing the "+GoogleCalendar" button in the lower right.

Net control is a skill that many operators should have and regularly practice. Please contact Howdy ke6bee@arrl.net if you are interested in taking a net control assignment.

Callsign	Name	Assigned Dates (skipped: Thanksgiving 11/23/2023)						
KE6BEE	Howdy Goudey	3/23/2023	5/25/2023	7/27/2023	9/28/2023	12/7/2023	2/8/2024	4/11/2024
KK6NDF	Hal Graboske	3/30/2023	6/1/2023	8/3/2023	10/5/2023	12/14/2023	2/15/2024	4/18/2024
KM6HBO	Jamuel Starkey	4/6/2023	6/8/2023	8/10/2023	10/12/2023	12/21/2023	2/22/2024	4/25/2024
KN6BUY	Tom Fattaruso	4/13/2023	6/15/2023	8/17/2023	10/19/2023	12/28/2023	2/29/2024	5/2/2024
K6RJM	Rob McNicholas	4/20/2023	6/22/2023	8/24/2023	10/26/2023	1/4/2024	3/7/2024	5/9/2024
KE6HCE	Armando Picciotto	4/27/2023	6/29/2023	8/31/2023	11/2/2023	1/11/2024	3/14/2024	5/16/2024
KJ6IUV	Frans Kuypers	5/4/2023	7/6/2023	9/7/2023	11/9/2023	1/18/2024	3/21/2024	5/23/2024
KN6CMR	Susan Yeaman	5/11/2023	7/13/2023	9/14/2023	11/16/2023	1/25/2024	3/28/2024	5/30/2024
KK6ZPM	Karen Fenton-Leong	5/18/2023	7/20/2023	9/21/2023	11/30/2023	2/1/2024	4/4/2024	6/6/2024

Thursday Net Training Exercises

Following the net check-ins every Thursday at 1900 on 146.415, KARO ECHO usually runs a training exercise to learn and practice skills that are important for successful disaster communications.

[A list of potential training exercises](#) is posted and maintained on the training page of the website.

[A log of our check-in counts can be found here.](#) Howdy KE6BEE typically updates this document in real time during the net, so you can check it against your log during or after the net.

For 2020: 1008 check-ins, avg. 21/week, high of 28, 72 unique callsigns

For 2021: 934 check-ins, avg. 19/week, high of 25, 55 unique callsigns

For 2022: 944 check-ins, avg. 19/week, high of 27, 59 unique callsigns, avg. 5 digital check-ins per week

For 2023: 279 check-ins, avg. 20/week, high of 23, 41 unique callsigns, avg. 6 digital check-ins per week

Thanks for your participation. Keep it up!

About KARO ECHO

KARO ECHO is the name of the Kensington Amateur Radio Operators and the El Cerrito Ham Operators mutual benefit association, an all-volunteer non-profit group of amateur radio operators providing auxiliary communications for the cities of Kensington and El Cerrito in the event of a disaster. KARO ECHO works with CERT (Community Emergency Response Teams) in Kensington and El Cerrito, but is not an official part of the CERT program.

Monthly in-person meetings of KARO ECHO are on the 2nd Monday of each month at 7:00 pm, in-person at the Kensington Community Center (KCC) as well as online using Zoom (hybrid meetings).

Yearly membership dues are \$30/year for individuals, \$40/year for a family membership. Payments can be given to the Treasurer at monthly meetings or mailed to the address below. Participation is welcome independent of paid membership, but only licensed amateur radio operators who are dues paying KARO ECHO members will be allowed to vote on KARO ECHO business. Dues cover our 510c3 registration, post office box, web page, station operating manuals and more. Your input on useful expenditures to aid emergency communications is welcome.

Mail to: KARO ECHO, PO Box 2025, 6324 Fairmont Ave, El Cerrito, CA 94530-3651

Please see our website for more information: www.karoecho.net

You can contact the KARO ECHO board by email: info@karoecho.net

KARO ECHO Facebook

The [KARO ECHO Group on Facebook](https://www.facebook.com/groups/1451216838315743/) has a lot of good information, more than is contained on our website. There is a whole wide world of emergency communications information at <https://www.facebook.com/groups/1451216838315743/> Check it out and be inspired of what we can do to help disaster victims in our community.

Weekly Training Net

The Karo-Echo Weekly Training Net meets every Thursday evening immediately after the West Co Co County RACES/ACS Net; but not before 1900 on 146.415 MHz Simplex. Our secondary frequency is 146.475 MHz simplex. Details at <https://www.karoecho.net/events>

Newsletter Content Wanted

Any input on content you'd like to propose for inclusion in the KARO ECHO newsletter can be sent to Howdy ke6bee@arrl.net We welcome all ideas for content including announcements, events, etc.

KARO ECHO Field Day Video

Thanks to Frans KJ6IUV for taking video and editing a nice [movie of Field Day activities](#).

Outreach, Education and Licensing

Local and Online Ham License Classes and Exams

Many ham license classes and exams are offered locally or entirely online. See a [list of opportunities on the KARO ECHO website](#)

Mutual Aid Presentation by Dan Goldstein

Daniel Goldstein KJ6KEU (the ARRL East Bay Section Emergency Coordinator and member of the Alameda County Sheriff's Communications Team) gave the presentation [EmComm Mutual Aid in a Digital World on Sept. 10](#).

ARRL Learning Network Webinars

Visit the [ARRL Learning Network](#) (a members-only benefit) to register, check on upcoming webinars, and to view previously recorded sessions.

Training for Beginning Operators

Jay KJ6WSS, Edward KM6UBY and Karen KK6ZPM gave an introductory radio class May 23rd 2020 introductory radio class, with emphasis on the GMRS radio BTECH-V1. [A recording of the class and other resources are available here](#).

Net Control Operator Training

Diane KK6RED, David KJ6AAT and Howdy KE6BEE taught an Apr 4th 2020 net control class. [The class recording is available here](#).

EMCOMM related videos

See the CERT SET Youtube video link

<https://www.youtube.com/watch?v=66DdgGLIn4c&list=PLROOaUIKdrEgSID1bQJZojW3PzfURoEY-&index=144&t=0s>

Post Camp Fire GMRS organization

https://www.youtube.com/watch?time_continue=220&v=aZiSC4sgKYw&feature=emb_logo

ELMERING

An online elmering forum can be accessed by emailing elmer@karoecho.net or browsing the associated google group. More in-depth elmering/mentoring is available by request.

In the meanwhile, please check out the plethora of useful information at <https://www.karoecho.net> website.

Encouragement to Monitor 146.415 and Explore Other Nets

It is always encouraged to monitor 146.415 (call out for others occasionally and make some casual contacts). A number of members have been having short impromptu nets following small earthquakes, power outages, etc. Everyone is encouraged to check-in for practice if you are available. There are a lot of other nets around the bay area that you can reach. Expand your radio horizons. See the [KARO ECHO Coordination page](#) for a listing of some other nets to explore. You can just listen at first, or program your radio (if a repeater is used) and try transmitting as a guest check-in to see if you can make contact.

KAROECHO.Net Website

Especially, check out the EVENTS Page (<https://www.karoecho.net/events>) and the WORKSTREAMS drop-down menu which will lead one to an extensive training page that provides online learning at your own pace. Everything from the very beginning to advanced EmComm operations is detailed. The RESOURCE page has many excellent outside links.

- ♦ This [new heading on the Events page](#) will be updated with recent additions to the website.
- ♦ If you are on Facebook, contribute to the KARO ECHO Facebook Group Page at <https://www.facebook.com/groups/1451216838315743/>
- ♦ If you haven't already filled out the **JOIN** form please do. Find it as a drop down menu under "Get Involved" See <https://www.karoecho.net/join>
- ♦ A [follow-through novice primer](#) has been put on the website for new hams once they have bought their radio and want to learn more.
- ♦ A [dual-band antenna primer](#) for new hams who want to graduate from the rubber-ducky world
- ♦ Note that the Tram 1480 gain dual band antenna is currently still available for \$51 (no tax and free shipping) on ebay or from Home Depot. That and an inexpensive speaker tripod is a dynamite combination for portable operation. This antenna is equivalent to the Diamond X-200a antenna which sells at HRO for \$125.00 before taxes and shipping.
- ♦ For newbies, please visit <https://www.karoecho.net/workstreams/training> and read the study materials. It is all there except for hands-on experience. Ask questions!
- ♦ Following the Thursday evening net check-in, there is often a training session and/or discussion.
- ♦ All recent KARO ECHO [Minutes will be found at our Past Events page](#) We are now including past Executive Board Minutes as well. [Newsletters are on the Documents Page](#).

If you desire to be removed from this email list, please email info@karoecho.net

Other Resources

"ALERTWildfire" camera links in our area:

[William Rust Summit cam](#)

[Wildcat Canyon cam](#)

[Vollmer Peak cam](#)

[Vollmer Tower Top cam](#)

[Pinole Ridge cam](#)

[View real-time data from any weather station in the state.](#)

[Zonehaven evacuation zone here by on this interactive map](#)

[Albany Radio Groups.io forum](#)

[Eastbay Resilience Groups.io forum](#)

[Marina Bay Neighbors and 1st Wed West county GMRS net](#)

The [HeyWhatsThat](#) website is an online tool that can map line of site paths with topography

To make it easy for amateurs to evaluate RF exposure,

ARRL provides an [RF exposure calculator](#) on its [RF Exposure page](#).

KARO ECHO Classifieds

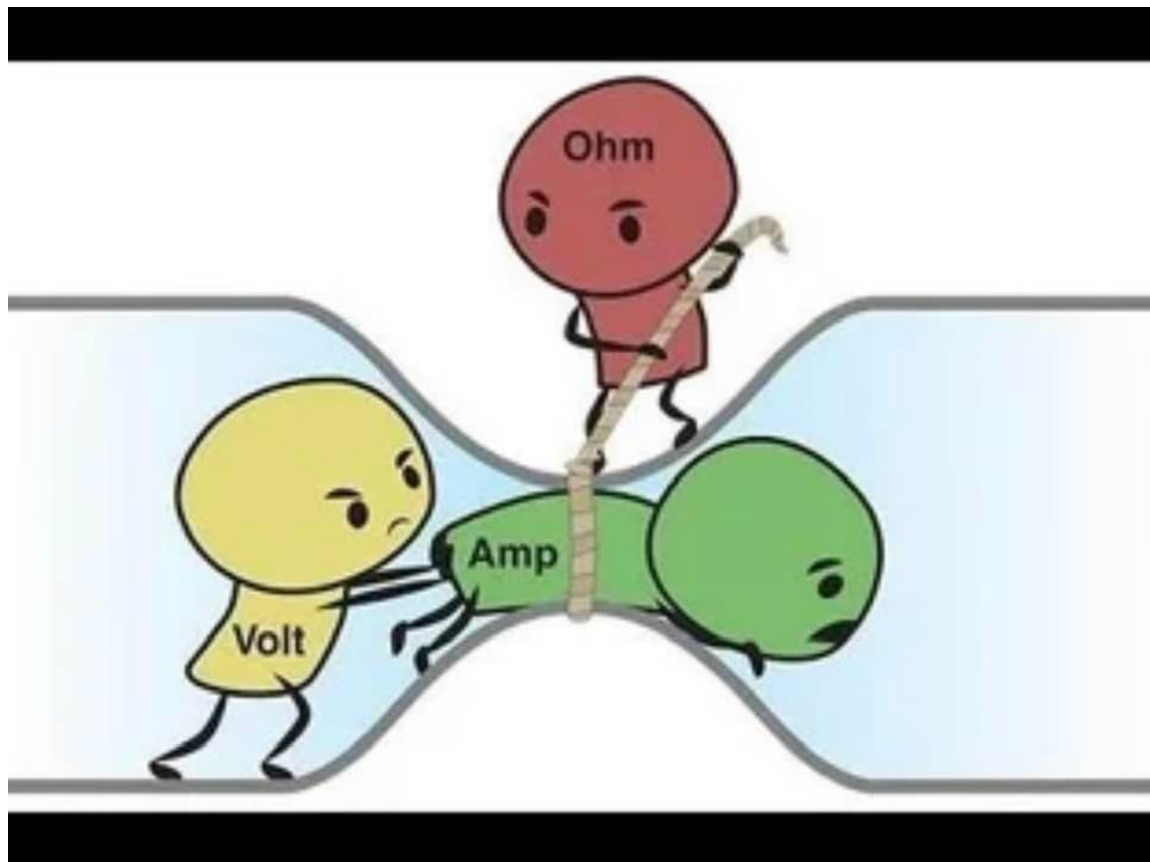
We are soliciting classified ads from KARO ECHO members, and friends, to facilitate gifting, swapping, selling radio gear and/or offering help/services such as loans of special equipment/tools, etc. Please send any content to the newsletter editor, Howdy ke6bee@arrl.net

Loaner radios/antennas/meters available for trial/testing, including:

HTs, larger mobile radios, gear for digital modes and mesh nodes, SWR/power meter

Contact: Howdy ke6bee@arrl.net

Available for free: B&K Precision 2120B oscilloscope - 20MHz bandwidth, dual trace, triggered sweep. Contact: Tom, KN6BUY, at tfat@sbcglobal.net



Visualizing Ohm's Law, courtesy of Tom KN6BUY